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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/679,151

10/06/2003

Naomasa Shiraishi

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EXAMINER

MATHEWS, ALAN A

ART UNIT

PAPER NUMBER

2851

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/22/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/679,151	Applicant(s) SHIRAIISHI, NAOMASA	
	Examiner Alan A. Mathews	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 42-63,69-74 and 87-92 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 42-63,69-74 and 87-92 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/423,457.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Substitute Specification

1. The substitute specification filed November 22, 2006, has been entered

Claim Rejections - 35 USC § 112

2. Claims 42-63, 69-74, and 87-92 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There appears to be no basis in the original disclosure for the method for imaging a fine pattern having linear features extending in orthogonal first and second directions and a method for providing a light source having decreased intensity portions at a center thereof and on first and second axes defined to intersect with each other at the center and defined along the first and second directions respectively as recited in claim 42. The Examiner does not find where the original disclosure describes forming an image with linear features extending in orthogonal first and second directions. The original disclosure discusses on page 54, lines 15-21, and page 57, lines 18-58, forming points P_{ϵ} , P_{η} , P_{χ} , and P_{μ} , and states these points are intersections of the line segment L_{α} , L_{β} , and L_{γ} or L_{η} . **But points on a line segment do not make linear features. Nor do points on intersecting lines make orthogonal linear features.**

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Nor does the original disclosure specifically state that the light source has a decreased intensity portions at a center thereof and on first and second axes defined to intersect with each other at the center and defined along the first and second directions.

Claim Rejections - 35 USC § 103

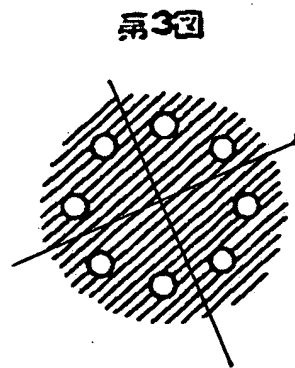
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 42-63, 69-74, and 87-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese patent document 61-91662 in view of Jewell et al. (U. S. Patent No. 4,947,413) and in further view of Minami et al. (U. S. Patent No. 4,153,336) or Susuki et al. (U. S. Patent No. 4,871,257). The Japanese patent document 61-91662 discloses in figure 5 an exposure system for projecting a fine pattern on reticle 8 onto object or workpiece (wafer) 15. The light source includes element 1 and aperture stop 9. Figure 3 discloses an aperture stop which is interchangeable with aperture stop shown 9 in figure 5 (see page 7, lines 37-42, and page 8, lines 1-22, of the English translation). If one drew a line 22 degrees from the horizontal, the stop in figure 3 would block the light along plane of incidence along the plane 22 degrees from the horizontal. Drawing a second line 22 degrees from the vertical would be orthogonal to

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the first line and would block the aling along the plane 22 degrees from the vertical (see drawing below).

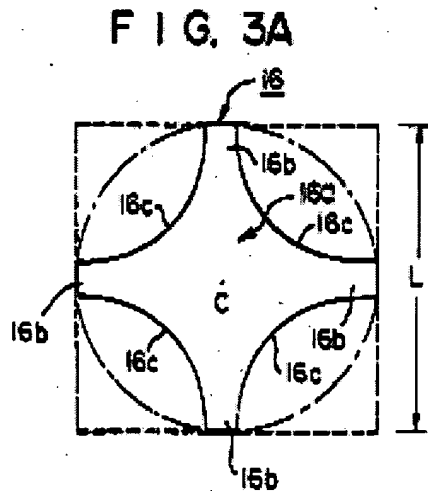


Thus, the aperture stop in Japanese patent document 61-91662 would produce decreased intensity portions at a center thereof and on first and second axes defined to intersect with each other at the center. The light from the other apertures would be a pair of paths which are symmetrical with each other with respect to the plane of incidence. The aperture stop 9 in figure 5 is “exchangeable” with other apertures stops in figures 1-4. Other optical elements in figure 5 or figure 6 in the Japanese patent document 61-91662 would be movable (to allow for some adjustment so that the image on the wafer 15). Thus, the Japanese patent document 61-91662 discloses the invention except for specifically disclosing that the fine pattern on reticle 8 of the

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Japanese patent document 61-91662 has linear features and correlating these linear features with the blocking portion of the aperture stop. Jewell et al. discloses in figure 2 that it is well known in the photolithography art to provide the reticle or mask with linear orthogonal features.

Minami et al. (U. S. Patent No. 4,153,336) discloses using a spatial filter 16 in figures 1 and 3A, 3B, 3C, and 3D, to block light in the horizontal and vertical directions. The spatial filter's interception area includes 16a and 16b (see spatial filter 16 below).

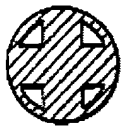


The Abstract in Minami et al. discloses on lines 6-11, that the spatial **filter has arm sections extending correspondingly to the linear components of said normal pattern.** Column 5, lines 46-59, also disclose that the filter includes vertical and horizontal components. Column 2, lines 66 and 67, disclose that the **subject pattern 7 (photomask) can be composed of**

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longitudinal and transverse straight lines (i.e. have linear components along first and second orthogonal directions). Minami et al. discloses exposing the pattern on 7 onto screen 17.

Suzuki et al. '257 discloses in figures 2, 5, and 13, using an aperture plate P_c having apertures at 45 degrees from the horizontal. In particular, **figure 13 of Suzuki et al. '257 discloses apertures in four quadrants**. Thus, the aperture plate would block light along the X and Y axis (see figure 13 below).

**FIG. 13**

In addition, Suzuki et al. '257 discloses in column 6, lines 3-6 and 35, and column 7, line 68, and column 8, line 1, the use of orthogonal lines in the circuit pattern and correlates the apertures in the aperture plate with these orthogonal lines. **In addition, figure 18 in Suzuki et al. '257 also discloses moving or exchanging stops**. Other optical elements in Suzuki et al. '257 would be movable for adjustments. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the Japanese patent document 61-91662 with linear features in view of Jewell et al. for the purpose of making the device in the Japanese patent document 61-91622 more useful to different circuit patterns. It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to provide the modified device of the Japanese patent document 61-91662 and Jewell et al. with these linear

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features correlated with orthogonal light blocking means along the X and Y axes in view of either Minami et al. or Suzuki et al. '257 for the purpose of making a better final product. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the modified device of the Japanese patent document 61-91662 and Jewell et al. with an exchangeable optical element in view of Suzuki et al.'257 for the purpose of making the modified apparatus more versatile (although the Examiner still maintains that the stops in the Japanese patent document 61-91662 are exchangeable).

With respect to Applicant's arguments, it is noted that each of the individual references, by themselves, do not explicitly disclose all the features of every claim. But this is a 35 USC 103 rejection. While the Japanese patent document 61-9166, by itself, may not disclose correlating linear features of a pattern with the blocking portions of the aperture stops, both Minami et al. and Suzuki et al.'257 disclose correlating linear features of a pattern with blocking portions of a spatial filter or aperture plate. With respect to Applicant's argument about a movable optical element, the optical elements in the Japanese patent document 61-91662 and Jewell et al and Minami et al. an Suzuki et al.'257 would need to be movable in order to provide some adjustment. Complex optical systems are not perfect when they are manufactured, and they require some adjustment.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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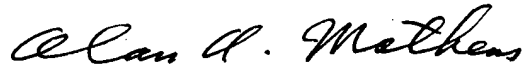
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan A. Mathews whose telephone number is (571) 272-2123. The examiner can normally be reached on Monday through Friday from 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571) 272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Alan A. Mathews
Primary Examiner
Art Unit 2851

AM